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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/788,958	02/28/2004	Richard E. Harper	YOR920030494US1 (710.034)	6692
58127 7590 12/15/2008 FERENCE & ASSOCIATES LLC 409 BROAD STREET PITTSBURGH, PA 15143			EXAMINER MEHRMANESH, ELMIRA	
			ART UNIT 2113	PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/788,958	<b>Applicant(s)</b> HARPER ET AL.	
	<b>Examiner</b> Elmira Mehrmanesh	<b>Art Unit</b> 2113	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3,5-23 and 25-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,5-23 and 25-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This action is in response to an amendment filed on November 18, 2008 for the application of Harper et al., for an "Automatic crash recovery in computer operating systems" filed February 28, 2004.

Claims 1, 3, 5-23 and 25-43 are pending in the application.

Claims 1, 19, 23, 39 and 43 have been amended.

Claims 2, 4 and 24 have been cancelled.

Claims 1, 3, 5-16, 19-23, 25-36 and 39-43 are rejected under 35 USC § 102.

Claims 17, 18, 37 and 38 are rejected under 35 USC § 103.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 5-16, 19-23, 25-36 and 39-43 are rejected under 35 U.S.C. 102(e) as being anticipated by Chandiramani et al. (U.S. Patent No. 6,691,250).

As per claim 1, Chandiramani discloses a method comprising:

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providing automatic recovery from operating system faults, said providing automatic recovery further comprising:

- detecting an operating system fault (Fig. 3A);
- analyzing the operating system fault (col. 9, lines 27-35);
- determining a cause of the an operating system fault (col. 9, lines 35-38);
- determining a solution (col. 9, lines 37-52);
- applying a solution (col. 10, lines 43-50);
- providing a resolution test; and returning to production (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 3, Chandiramani discloses at least one of the recited steps does not require any work (Fig. 3B).

As per claim 5, Chandiramani discloses said detecting step comprises at least one of: an operating system call to a halting routine and an exception or error associated with at least one of: an operating system, middleware, firmware and Licensed Internal Code (Fig. 9).

As per claim 6, Chandiramani discloses said detecting step comprises an abnormal termination of a driver or application (col. 9, lines 42-46).

As per claim 7, Chandiramani discloses said detecting step comprises a hypervisor observation of unusual behavior from a guest operating system (Fig. 2).

As per claim 8, Chandiramani discloses said detecting step comprises an interception of a call to an operating system halting routine or exception handler (Fig. 9).

As per claim 9, Chandiramani discloses said detecting step comprises automatically inspecting at least one aspect relating to the operating system (col. 9, lines 43-47).

As per claim 10, Chandiramani discloses said detecting step comprises automatically inspecting at least one of: main memory; a kernel stack; process stacks; a state of all running threads; an amount of pageable memory used; an amount of pageable memory free for use; an amount of total pageable memory in the system; an amount of total pageable memory available to the operating system kernel; an amount of non-pageable memory used; an amount of Non-pageable memory free for use; an amount of total non-pageable memory in the system; an amount of total non-pageable memory available to the operating system kernel; a number of system page table entries used; a number of system page table entries available for use; an amount of virtual memory allocated to a system page table; a size of a system cache; a size of a page cache; a size of a

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file cache; an amount of space available in a system cache; an amount of space available in a page cache; an amount of space available in a file cache; a size of a system working set; a number of system buffers available; page sizes; a number of network connections established; utilization of one or more central processing units; a number of threads allocated; a percentage of time spent in a kernel; a number of system interrupts per unit time; a number of page faults per unit time; a number of page faults in a system cache per unit time; a number of paged pool allocations per unit time; a number of non-paged pool allocations per unit time; a length of look-aside lists; a number of open file descriptors; an amount of free space on a disk or disks; a percentage of time spent at interrupt level; a number of device drivers that are loaded; status of loaded device drivers; a number of outstanding I/O requests for device drivers; a state of devices attached to the system (col. 9, lines 43-47).

As per claim 11, Chandiramani discloses automatically inspecting comprises determining a degree of memory corruption (col. 9, lines 27-38).

As per claim 12, Chandiramani discloses manual fault resolution is prompted if memory corruption is detected (col. 10, lines 43-50).

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As per claim 13, Chandiramani discloses said step of automatically inspecting is performed via software (col. 8, lines 21-23).

As per claim 14, Chandiramani discloses said step of determining a cause comprises identifying at least one faulty component (col. 9, lines 35-37).

As per claim 15, Chandiramani discloses said analyzing step provides input into said step of determining a cause (col. 9, lines 30-40).

As per claim 16, Chandiramani discloses external information provides input into said step of determining a cause (col. 9, lines 1-10).

As per claim 19, Chandiramani discloses said step of providing a resolution test comprises monitoring a new component during a trial period (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 20, Chandiramani discloses the trial period is over a finite period of time (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 21, Chandiramani discloses the status of the new component is reported subsequent to the trial period (col. 10, lines 62-67 through col. 11, lines 1-4).

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As per claim 22, Chandiramani discloses at least one of the following steps is repeated upon determination of a negative status of the new component:

- detecting an operating system fault (Fig. 3A);
- analyzing the operating system fault (col. 9, lines 27-35);
- determining a cause of the an operating system fault (col. 9, lines 35-38);
- determining a solution (col. 9, lines 37-52);
- applying a solution (col. 10, lines 43-50); and
- providing a resolution test (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 23, Chandiramani discloses an apparatus comprising:  
an arrangement for providing automatic recovery from operating system faults, said providing automatic recovery further comprising:

- an arrangement for detecting an operating system fault (Fig. 3A);
- an arrangement for analyzing the operating system fault (col. 9, lines 27-35);
- an arrangement for determining a cause of the an operating system fault (col. 9, lines 35-38);
- an arrangement for determining a solution (col. 9, lines 37-52);
- an arrangement for applying a solution (col. 10, lines 43-50);
- an arrangement for providing a resolution test; and an arrangement for returning to production (col. 10, lines 62-67 through col. 11, lines 1-4).



As per claim 25, Chandiramani discloses said detecting step comprises at least one of: an operating system call to a halting routine and an exception or error associated with at least one of: an operating system, middleware, firmware and Licensed Internal Code (Fig. 9).

As per claim 26, Chandiramani discloses said detecting arrangement is adapted to provide an abnormal termination of a driver or application (col. 9, lines 42-46).

As per claim 27, Chandiramani discloses said detecting arrangement is adapted to provide a hypervisor observation of unusual behavior from a guest operating system (Fig. 2).

As per claim 28, Chandiramani discloses said detecting arrangement is adapted to provide an interception of a call to an operating system halting routine or exception handler (Fig. 9).

As per claim 29, Chandiramani discloses said detecting arrangement is adapted to automatically inspect at least one aspect relating to the operating system (col. 9, lines 43-47).

As per claim 30, Chandiramani discloses said detecting arrangement is adapted to automatically inspect at least one of: main memory; a kernel stack;

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process stacks; a state of all running threads; an amount of pageable memory used; an amount of pageable memory free for use; an amount of total pageable memory in the system; an amount of total pageable memory available to the operating system kernel; an amount of non-pageable memory used; an amount of Non-pageable memory free for use; an amount of total non-pageable memory in the system; an amount of total non-pageable memory available to the operating system kernel; a number of system page table entries used; a number of system page table entries available for use; an amount of virtual memory allocated to a system page table; a size of a system cache; a size of a page cache; a size of a file cache; an amount of space available in a system cache; an amount of space available in a page cache; an amount of space available in a file cache; a size of a system working set; a number of system buffers available; page sizes; a number of network connections established; utilization of one or more central processing units; a number of threads allocated; a percentage of time spent in a kernel; a number of system interrupts per unit time; a number of page faults per unit time; a number of page faults in a system cache per unit time; a number of paged pool allocations per unit time; a number of non-paged pool allocations per unit time; a length of look-aside lists; a number of open file descriptors; an amount of free space on a disk or disks; a percentage of time spent at interrupt level; a number of device drivers that are loaded; status of loaded device drivers; a number of outstanding I/O requests for device drivers; a state of devices attached to the system (col. 9, lines 43-47).

As per claim 31, Chandiramani discloses automatically inspecting comprises determining a degree of memory corruption (col. 9, lines 27-38).

As per claim 32, Chandiramani discloses manual fault resolution is prompted if memory corruption is detected (col. 10, lines 43-50).

As per claim 33, Chandiramani discloses said detecting arrangement is adapted to perform automatic inspecting via software (col. 8, lines 21-23).

As per claim 34, Chandiramani discloses said arrangement for determining a cause is adapted to identify at least one faulty component (col. 9, lines 35-37).

As per claim 35, Chandiramani discloses said analyzing arrangement provides input into said arrangement for determining a cause (col. 9, lines 30-40).

As per claim 36, Chandiramani discloses external information provides input into said arrangement for determining a cause (col. 9, lines 1-10).

As per claim 39, Chandiramani discloses said arrangement for providing a resolution test comprises monitoring a new component during a trial period (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 40, Chandiramani discloses the trial period is over a finite period of time (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 41, Chandiramani discloses said arrangement for providing a resolution test is adapted to report the status of the new component subsequent to the trial period (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 42, Chandiramani discloses at least one of the following is repeated upon determination of a negative status of the new component:

- detecting an operating system fault (Fig. 3A)
- analyzing the operating system fault (col. 9, lines 27-35);
- determining a cause of the an operating system fault (col. 9, lines 35-38);
- determining a solution (col. 9, lines 37-52);
- applying a solution (col. 10, lines 43-50); and
- providing a resolution test (col. 10, lines 62-67 through col. 11, lines 1-4).

As per claim 43, Chandiramani discloses a program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for providing automatic recovery from operating system faults (col. 8, lines 21-23), said method comprising the steps of:

- providing automatic recovery from operating system faults, said providing automatic recovery further comprising:

- detecting an operating system fault (Fig. 3A)

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analyzing the operating system fault (col. 9, lines 27-35);  
determining a cause of the an operating system fault (col. 9, lines 35-38);  
determining a solution (col. 9, lines 37-52);  
applying a solution (col. 10, lines 43-50);  
providing a resolution test; and applying a solution (col. 10, lines 62-67  
through col. 11, lines 1-4).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 17, 18, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chandiramani et al. (U.S. Patent No. 6,691,250) in view of Aija et al. (U.S. Patent No. 6,928,579).

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As per claims 17 and 37, Chandiramani discloses of installing fault instance handlers (col. 10, lines 43-48), however he fails to explicitly disclose an automatic download and install.

Aija teaches:

said step of applying a solution comprises effecting one or more changes or updates in at least one of: device driver software, and firmware; wherein said solution is automatically downloaded and installed (col. 3, lines 40-45) and (col. 4, lines 10-25).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method of fault handling and recovery of Chandiramani et al. in combination with the crash recovery system of Aija et al. to effectively recover from operating system faults.

One of ordinary skill in the art at the time of the invention would have been motivated to make the combination because both inventions disclose detecting system crashes (Chandiramani, Fig. 3A) and (Aija, col. 4, lines 10-25).

Chandiramani discloses of installing fault instance handlers to handle the specific faults (col. 10, lines 43-48). However Chandiramani does not disclose the automatic download and install. Aija discloses automatic download and install of software for fault recovery (col. 3, lines 40-45) and (col. 4, lines 10-25).

As per claims 18 and 38, Aija discloses said step of effecting one or more changes or updates comprises deactivating faulty software (col. 2, lines 8-37).

***Response to Arguments***

Applicant's arguments filed November 18, 2008 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Elmira Mehrmanesh whose telephone number is (571) 272-5531. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert W. Beausoliel can be reached on (571) 272-3645. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Robert W. Beausoliel, Jr./  
Supervisory Patent Examiner, Art Unit 2113